Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Huish, *Samplers, Tapestries, and Embroideries;* Champeaux, *Tapestry;* Rock, *Textile Fabrics*, p. 99; Labarte, *Illustrated Handbook of the Arts of the Middle Ages*, p. 86; Woltmann and Woermann, *History of Painting;* "Textiles," *Britannica;* Lowell, "The Bayeux Tapestry," *Scribner's Magazine*, Vol. I, p. 333; Bruce, "The Bayeux Tapestry Elucidated," *Littell's Living Age*, Vol. XLVIII, p. 341; "The New Gallery of Tapestries in Florence," *Harper's Magazine*, Vol. LXXVII, p. 561; "The Arras Tapestries of the San Graal at Stanmore Hall," *The Studio*, Vol. VI, p. 98; Mackail, *Life of William Morris.*

XV. The modern home.

Cook, *The House Beautiful;* Gardner, *Homes and All about Them;* Lyon, *Colonial Furniture of New England;* Wharton and Codman, *Decoration of Houses;* Wheeler, *Household Art; The Studio; The House Beautiful.*

ELEMENTARY MATHEMATICS.

GEORGE W. MYERS.

THOSE who look with disfavor upon teaching elementary mathematics as an aid to the other subjects contend that the advocates of this practice are only seeking to make school work easy. This argument, however, can carry weight only with those who have not yet attempted to bring elementary number-teaching into this relation. All teachers who have had experience know how much more difficult it is to teach number and at the same time to make it *tell something* to the pupil, than it is to teach number as a separate and unrelated subject. The former demands no less facility in technique than does the latter, while it requires much more exercise of judgment and choice of points of attack. It would be much more to the point to argue against this practice in elementary mathematics on the ground of its extreme difficulty.

The only strength the argument derives from practice is that teachers "without a margin" of scholarship find the practical difficulties so great that they do not work the theory up to its possibilities. This is all the more true from the fact that previous training unconsciously draws the teacher back into the well-worn channels of pure form- and symbol-teaching. But the few who have persisted find the road grows easier as the evidences of growth in the pupils' power to use this invaluable tool become more frequent and more convincing. The tyranny of theory yields, though doggedly, to persistent well-doing.

Successful teaching of this sort means directly the opposite of "dawdling with applications," of spineless thinking—it means attentive interest, virility and steadiness of thought—it means not alone skill, it means the right use of skill—it means *power*. But this is said only of successful teaching, which does exist, though in not so great a degree as could be desired. Let every earnest mathematical teacher, from first to last, close his ears at times to current pedagogical din, and put to himself the question: "Is the purpose of my teaching primarily to secure *technique*, or *power to reason, to think?*" and if he can conscientiously answer *technique*, save to atone for the neglect of previous teaching, every purposeful pupil has reason to hope that he may have no part nor lot with such a teacher.

OUTLINE FOR DISCUSSION AND STUDY.

I. Suggested number plan for Grades I to IV.

Study of strength of timber.—1. Have one of the later grades cut out and plane down half a dozen sticks to 24 × ½ × ½ inches of pine, ash, hemlock, hickory, elm, red oak, and white oak.

2. Distribute these to the class, and have pupils examine the grain and other qualities by which they can identify the different varieties.

3. Provide each pupil with a sample of each variety to be studied; have pupils measure length, breadth, and depth; and record the measures in metric units. How long is the stick? how broad? how deep?

4. Support one of the sticks at the ends on chairs, or otherwise, and require pupils to find by measurement the middle, and to attach weights (a light weight first, then gradually increase the weights) by a string to the stick at this middle point. What is ½ of 24 inches?

5. Lay a straight bar (meter or yard stick) along the top surface of the stick and notice how it changes its form as the load is increased. For each load measure how far the stick "sways" at the middle below the edge of the straight bar. Record these measures.

6. Load the stick until it breaks. Record the breaking load and the "bend" just before breaking in columns of a little table. (*a*) What was the greatest bend before the stick broke? (*b*) What was the weight of the load that broke the stick? (*c*) What was the "bend" for each load before breaking? (*d*) What was each load? (*e*) One beam bends how many times as much as the other?

7. Treat each beam in this way. (*a*) What load broke the pine? the oak? etc. How much greater was the load required to break the oak than the pine, etc.? (*b*) What was the "bend" of the pine before breaking? the oak? which bent the more, and how much? (*c*) Which wood is the strongest, and how much? How many more pounds or grams did it hold than the next strongest? (*d*) Which is the weakest wood? How many more pounds or grams did the strongest hold than the weakest? (*e*) Which stick bent most? Answer in inches or centimeters and parts of an inch or centimeters.

8. Now distribute some 12-inch sticks and experiment as before, loading the sticks at the middle. Which holds more and how much, a 24-inch or a 12-inch pine beam? oak? hemlock? etc.

9. Take 24-inch sticks first, then 12-inch sticks, and load equally at the quarter points. (*a*) What is $\frac{1}{4}$ of 12″? $\frac{2}{4}$ of 12″? $\frac{3}{4}$ of 12″? $\frac{4}{4}$ of 12″? (*b*) What is $\frac{1}{4}$ of 24″? $\frac{2}{4}$ of 24″? $\frac{3}{4}$ of 24″? $\frac{4}{4}$ of 24″? (*c*) What is $\frac{1}{2}$ of 24″? of 12″? $\frac{1}{2}$ of 24″ is how many fourths of 24″? (*d*) The long stick is how many inches longer than the short stick? How many times longer? (*e*) The long stick would make how many of the short sticks? (*f*) What is $\frac{1}{2}$ of 24″? $\frac{2}{2}$ of 24″? $\frac{3}{2}$ of 24″?

10. How many pounds or grams were at each quarter point when the stick broke? How many at all three of the quarter points?

11. In which case did the stick carry more, and how much more, when the load was all at the middle, or distributed at the three quarter points? How was this with the shorter sticks?

12. In which case did the stick "bend" the more, and how much, when loads were distributed, or with single load at center? How was this with the shorter sticks (12″)?

13. What is the best kind of timber for heavy loads, where it is not desired to have pieces too large?

14. What is the best way to load the stick to keep it from breaking, one load at middle, or one-third as much at each of the three-quarter points?

15. Can you lift as much weight as was needed to break the stick? more? how much more or less?

16. Now it would be well to study sapwoods, heartwoods, woods between sap and heart.

NOTE 1.—In each case do not fail to bring out the *number fact*. Allow the pupil to answer by *measurement*. At close of each recitation summarize the number facts used in a three- to five-minute review and drill. Facts of the addition table or multiplication table should be written by the pupil in a notebook, or on the board, and kept handy for reference.

Do not fail to observe note 1.

NOTE 2.—Only the salient number facts are specified in this outline, just enough to suggest the mode of proceduce.

NOTE 3.—Materials must all be prepared and ready before the number recitation. The manipulation *does not belong to number teaching.*

II. Questions.

1. How many lessons are needed for this?
2. What grade of maturity is demanded?
3. Will the girls be interested? Try it.
4. Criticise in some other way than to cry "too hard!"

ART.

JOHN DUNCAN.

SOME questions with regard to the teaching of drawing reappear from time to time, and the following is an attempt at replying to one or two These paragraphs form a condensed report of a discussion in the pedagogic class put into the form of question and answer.

Q. Is it enough to provide opportunities for drawing, while the work is left undirected?

A. This is analogous to turning children loose on a field excursion and calling the meager results "nature study." Teachers must see to it that these opportunities in each case are properly used.

Q. To state the same question in a different way, do you not think the children get a good deal in the mere practice of drawing?

A. All "busy work" with the pencil or paint brush is not educative drawing; it may be the worst kind of industrious idleness, blunting the sense and corrupting the taste.

Q. How should one criticise children's drawings?

A. There should be no destructive criticism. One should say, "Thus the line should go," "Let me show you how to mix the tint;" never, "Your colors are false!" or "Your lines are askew!" Elicit the child's own ideas by question and suggestion; help him to realize *himself;* if need be, lift him *over* an obstacle in his path, if it fret him overmuch.

Q. I saw you doing a face for one of the children of the eighth grade. Do you think that was the right thing to do?

A. In that particular case, yes! The boy's critical power had far outrun his skill; he could not do the face in such a way as to satisfy himself, and if I had not drawn it for him, the time would have been consumed in fretting. As it was, he settled down to the work and made something of the rest of it. Next time he will at least be better able to deal with the more difficult parts of the drawing, having felt his own powers in motion and gained some little confidence in himself in the doing of the rest of the work. Neither he nor I deceived ourselves into the belief that the drawing was other than our joint production.